Errata
An Introduction to the Physics of High Energy Accelerators

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The first printing of *An Introduction to the Physics of High Energy Accelerators* contained a number of errors which were caught by the authors or brought to our attention, and corrections were made for the second printing. Some were simple typographical issues, while others were indeed just incorrect statements, and we thank all our colleagues for their help in pointing them out. One of the more interesting mishaps to note occurred during the first draft of the manuscript from the publisher – every occurrence of the letter combination "if" was inadvertently deleted from Chapter 3. The, word "identify" turned into "identy," while "verify" turned into "very." (The former was easily *identified*, while the latter was harder to see.) And, of course, occasionally the word "if" was just altogether missing, making very interesting sentences. Most of these were found early on, but we notice that a couple still exist, perhaps more.

Since the second printing, no new corrections were ever submitted to the publisher. The *errata* presented here correspond to this second printing. At the time of this writing, copies of the textbook are reproduced "on-demand" which hinders the creation of future corrected copies. We hope that readers will find this document useful and we also encourage them to continue to point out errors and provide corrections to us for future postings.

- Page vi –
  4.2 The Hamiltonian Formalism *should read* 4.3 The Hamiltonian Formalism
- Page 73 –
  Preceding Eq. 3.60, the words "If we rewrite Equation 3.55 as" *should read* "If we rewrite Equation 3.54 as"
- Page 84 – top of page...
  $\vec{B} = \hat{y}B'\,x$ *should read* $B_y = B'\,x$
- Page 85 – end of section 3.2...
  exemplied *should read* exemplified
- Page 86 – mid-page...
  "quantying" *should read* "quantifying"

- Page 89 –
  The entry in Table 3.2 for f, when $K < 0$, *should read* $\frac{e}{p\sqrt{|K|}}\, B_0\, \sinh\sqrt{|K|}\, l$

- Page 91 – Second from last line...
  "specied" *should read* "specified"

- Page 103 – in Problem 19...
  $f = 4\beta_0$ *should read* $f = \beta_0/4$
  and, in Problem 22,
  $\left(\sum_i \theta_{rms}^2 \beta_i \sin^2(\pi\nu - \psi_i)\right)^{1/2}$ *should read* $\left(\sum_i \theta_i^2 \beta_i \cos^2(\pi\nu - \psi_i)\right)^{1/2}$

- Page 105 – in Problem 28,
  the final result... *should read* $\left(\frac{\Delta\beta}{\beta}\right)_{rms} = \frac{q_{rms}\beta_{rms}}{2|\sin 2\pi\nu|}\sqrt{N/2}$

- Page 114 –
  Replace Equation 4.16 and the subsequent wording with

$$\left(\beta^{(n+3)/2} b_n\right) = \sum_k c_{k,n}\, e^{\pm ik\phi} \tag{4.16}$$

  while the solution of the homogeneous equation of motion can be written as

$$\zeta(\phi) = \zeta_0\, e^{\pm i\nu\phi}. \tag{4.17}$$

- Page 120 –
  Following Equation 4.49, the words "... can indeed by found ..." *should read* "... can indeed be found ..."

- Page 125 –
  The vertical axis in Figure 4.8 should be labeled p_x, consistent with Figure 4.6.

- Page 129 –
  In the first footnote, the title of Michelotti's reference *should read* "... Arising from Magnetic Multipoles," ...

- Page 185 –
  It should have been noted that the result given in Eq. 6.46 assumes that $n > 0$.

- Page 195 –
  Eqs. 6.104-6.107 should have read as follows...

$$cB_z = -C_m r^m \sin m\theta\, \frac{1}{|z - ct|^{3/2}}\,, \tag{6.104}$$

$$cB_r = -E_\theta - 2C_m m r^{m-1} \sin m\theta\, \frac{1}{|z - ct|^{1/2}}\,, \tag{6.105}$$

$$cB_\theta = -E_r - 2C_m m r^{m-1} \cos m\theta\, \frac{1}{|z - ct|^{1/2}}\,, \tag{6.106}$$

  where

$$C_m = \frac{Q_m}{\pi b^{2m+1}} \sqrt{\frac{c}{4\pi\epsilon_0\sigma}}\,. \tag{6.107}$$

- Page 215 –
  In Problem 2, part (a), the equation *should read*

$$\frac{d^2u}{d\psi^2} + u = 4\,\frac{\Delta\nu}{\nu}\,\frac{1}{u}\,\left(1 - e^{-u^2/2}\right),$$

- Page 243 –
  Just above Equation 7.92, "... for the case $\sigma/a = 0.2$." *should read* " ... for the case $\sigma/a = 0.4$."

- Page 251 –
  The "15 MeV" in Eq. 7.128, *via* a more careful analysis, is replaced by

$$15 \text{ MeV} \rightarrow (13.6 \text{ MeV})(1 + 0.038 \ln(l/L_{rad})$$

  See V.L. Highland, *Nucl. Instrum. Methods* **129**, 497 (1975), and *Nucl. Instrum. Methods* **161**, 171 (1979); also, G.R. Lynch and O.I Dahl, Nucl. Instrum. Methods **B58**, 6 (1991).

- Page 280 –
  Equation 8.52 ... *should read* $\frac{dP(w)}{dw} = \frac{P}{w_c}\,S(w/w_c)$